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P. J. & G. J. IHRIG.

MUFFLER.

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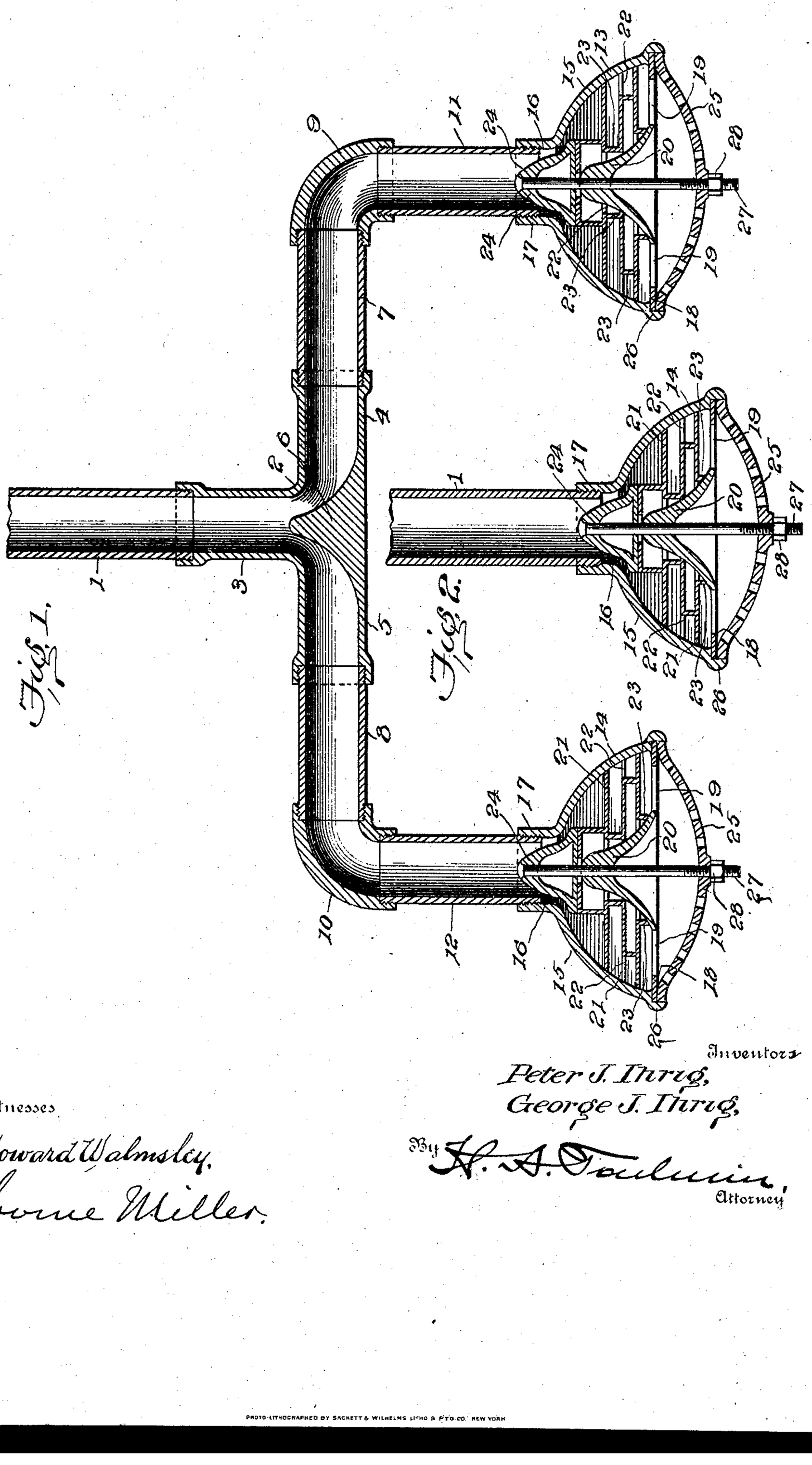

Fig. 1.

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

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MUFFLER.

SPECIFICATION forming part of Letters Patent No. 794,226, dated July 11, 1905.

Application filed May 6, 1904. Serial No. 206,624.

To all whom it may concern:

Be it known that we, PETER J. IHRIG and GEORGE J. IHRIG, citizens of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Gas-Engine Mufflers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to gas-engine mufflers, and is in the general nature of an improvement upon the construction set forth in United States Letters Patent No. 718,131, granted January 13, 1903, to George J. Ihrig and Ernest C. Ihrig as assignees of Joseph F. Kurtis and Herman F. Miller.

The present invention has for its object to simplify the construction and at the same time increase the efficiency of the device.

To these ends our invention consists in certain novel features, which we will now proceed to describe and will then particularly point out in the claims.

In Figure 1 of the accompanying drawings is shown a central sectional view of a structure embodying our invention in one form and in Fig. 2 a similar view in another form.

In the said drawings, 1 indicates the exhaust-pipe, to which is secured a T-shaped coupling 2, having a branch 3, which is connected with the exhaust-pipe, and two other branches 4 and 5, arranged at right angles to the branch 2 in alinement with each other and extending in opposite directions. At the point where the three members of the part 2 unite there is located a conical deflector 6, having its central axis arranged in line with the inlet branch 3 and serving to divide the exhaust and direct it into the branches 4 and 5 at the same time preventing the noise which would otherwise arise from the shock of the discharge of the exhaust if the branches 4 and 5 were continuous and presented a wall at right angles to the discharge-mouth of the branch 3. The branches 4 and 5 are connected by pipes 7 and 8 and by right-angled bends 9 and 10 with two parallel outlet-pipes 11 and 12, provided, respectively, with exhaust-heads 13 and 14. As the construction of these two exhaust-heads is similar, we will describe only one of them in detail, it being understood that the same description is equally applicable to the other. Each head is composed of a bowl 15 of outwardly-increasing diameter and having its body preferably curved, as shown. At its smaller end this bowl has an inlet-opening 16, surrounded by a collar 17, by means of which it is connected to the outlet-pipe 11. The other or larger end of the bowl is covered by a plate or diaphragm 18, having outlet-apertures 19 formed therein around its marginal portion. The central portion of the plate 18 is formed into a reëntrant conical boss 20, which extends into the interior of the bowl and forms a deflecting-cone, its sides being preferably curved, as shown in cross-section, this sectional curvature of the cone being the reverse of the sectional curvature of the bowl hereinbefore referred to. The space within the bowl between the body thereof and the cone 20 is occupied by a series of diaphragms 21, constructed substantially as set forth in the prior Letters Patent hereinbefore referred to, having their alternate inner and outer margins provided with openings 22, formed by slitting the material and bending the tongue thus formed at right angles to the diaphragms to form deflecting-plates 23, which also serve to space the diaphragms apart.

24 indicates a conical deflecting boss or cone formed integrally with the bowl 15, to which it is connected by suitably-spaced webs or bridge-pieces or otherwise secured in position within the said bowl, its location being immediately in front of the cone 20 and extending into the inlet-opening 16 of the head.

25 indicates a cup-shaped cap or closure extending over the outer end or discharge-mouth of the bowl, which is provided with a seat 26 to receive the plate 19 and cap 25. A bolt 27 extends through the cones 24 and 20 and through the cap 25 and receives on its threaded outer end, which projects beyond said cap, a nut 28, by means of which the cone 24, cap 25, plate 19, and diaphragms or baffle-plates are all clamped in position within the bowl.

It will be observed that the products of combustion escaping from the exhaust-pipe 1 are noiselessly deflected into two diverging pipes or conduits, each of the same area as the exhaust-pipe, thereby permitting the exhaust to expand, and consequently reducing its pressure and noise-producing capacity. This latter characteristic is still further reduced by the passage of the exhaust through the pipes 7 and 8, around the bends 9 and 10, and through the outlet-pipes 11 and 12. The divided exhaust therefore reaches the exhaust-heads 13 and 14 with a pressure considerably reduced. Passing through these heads the exhaust-gases, by reason of their retardation and subdivision and their passage successively into spaces of increasing capacity, are finally discharged in a practically noiseless manner. It will be noted that the construction is much simpler, and consequently less expensive, than the structure set forth in the prior patent hereinbefore referred to, and we have found in practice that a material gain in efficiency for the purposes sought to be accomplished is effected.

We do not wish to be understood as limiting ourselves strictly to the precise details of construction hereinbefore described, and shown in the accompanying drawings, as the same may obviously be modified without departing from the principle of our invention. For instance, and as shown in Fig. 2, one of the exhaust-heads may be connected directly with the exhaust-pipe 1 in the case of use with small engines. The construction of the head is such that when the engine is small the exhaust will be discharged in a practically noiseless manner; but in the case of engines where the shock of the exhaust is great then the dual arrangement becomes necessary to obtain the desired results, one of the peculiarities of operation in that case being the subdivision of the exhaust into branches.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a muffler, the combination, with an exhaust-pipe, of a plurality of outlet-pipes of substantially the same diameter as the exhaust-pipe beyond their divergence therefrom, connected with said exhaust-pipe and each provided with a separate exhaust-head discharging independently into the atmosphere, substantially as described.

2. In a muffler, the combination, with an exhaust-pipe, of a T-shaped fitting connected therewith by one of its branches, its other branches extending in opposite directions, said fitting having a deflecting-cone located between the two last-mentioned branches opposite the outlet-mouth of the branch which is connected to the exhaust-pipe, all of said branches being of a diameter substantially equal to that of the exhaust-pipe beyond their point of divergence, parallel outlet-pipes connected with the discharge branches of said fitting, and separate exhaust-heads mounted on the discharge ends of said outlet, substantially as described.

3. In a muffler, the combination, with an exhaust-pipe, of a T-shaped fitting connected therewith by one of its branches, its other branches extending in opposite directions, said fitting having a deflecting-cone located between the two last-mentioned branches opposite the outlet-mouth of the branch which is connected to the exhaust-pipe, all of said branches being of a diameter substantially equal to that of the exhaust-pipe beyond their point of divergence, parallel outlet-pipes connected with the discharge branches of said fitting, and separate exhaust-heads mounted on the discharge ends of said outlet-pipes, each exhaust-head comprising a bowl-shaped body having relatively large and small openings at its opposite ends, a plate extending across the outlet end, provided with outlet-openings, and having a central deflecting-cone extending into the bowl, baffle-plates fitted at intervals between the said deflecting-cone and bowl, a second deflecting-cone extending into the inlet-opening of the bowl, and an outer perforated cap or closure of cup-like form, substantially as described.

4. In a muffler, the combination, with an exhaust-pipe, of an exhaust-head comprising a bowl-shaped body having relatively large and small openings at its opposite ends, a plate extending across the outlet end, provided with outlet-openings, and having a central deflecting-cone extending into the bowl, and baffle-plates within the bowl, substantially as described.

5. In a muffler, the combination, with an exhaust-pipe, of an exhaust-head comprising a bowl-shaped body having relatively large and small openings at its opposite ends, a plate extending across the outlet end, provided with outlet-openings, and having a central deflecting-cone extending into the bowl, baffle-plates fitted at intervals between the said deflecting-cone and bowl, a second deflecting-cone extending into the inlet-opening of the bowl, and an outer perforated cap or closure of cup-like form, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

PETER J. IHRIG.
GEORGE J. IHRIG.

Witnesses:
E. O. HAGAN,
F. W. SCHAEFER.